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物理獨立讀書報告之實施與成效
The Implementation and Outcomes of an Independent Study Project in University Physics

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中文摘要

本文主旨在探討大學「普通物理」課程中，引入獨立讀書報告，對學習成效的助益與可能面臨的困難，並提供教學實務者建言。本研究為作者所執行的行動研究，採用質的詮釋性分析方法。在發回報告評分結果的同時，作者邀請學生填寫一份不具名的開放式問卷。參與者為大一理工科學生，共 95 人。為了落實高等教育的廣義目標，培養學生的獨立學習能力，作者在其任課的「普通物理」課程中，引導學生進行課外讀物的獨立學習，並撰寫心得報告。問卷結果顯示，這類開放式學習活動對學生所帶來的挑戰性極高，但多數學生卻能肯定這項「另類」學習的意義。參與的學生認為，這項學習活動所帶來的收穫，不僅限於知識面的增進，也包含學習能力及學習態度的提昇，其中包含資料蒐集、統整、溝通，以及自覺、自律...等後設認知能力。因此，這項學習任務應更能符合高等教育的廣義教學目標：培養學生具備終身學習的能力及態度。最後，作者也對實務工作者，提供幾項建言，包含：教師如何在鼓勵學習獨立性與提供學生所需的必要指引間取得平衡，另外，誘導少數持「灌輸式」學習觀的學生，體認這項「另類學習」的價值及重要性，也將是未來教師執行時的重要課題之一。

關鍵字：高等教育; 課程目標; 物理課程; 獨立學習活動; 終身學習

Abstract

The purposes of this study were to investigate the potential outcomes and barriers of implementing an independent study project in university physics. Based on the author's action research, this study adopted qualitative interpretive approaches to analyze the data. The researcher invited her students to fill in an open-ended questionnaire regarding their comments on the independent study project, where 95 students participated the survey. Reflecting on a broad perspective of the aims of higher education, the researcher introduced an independent study project to her first year engineering students in University Physics. The students were expected to select a topic in science, search and read the references, and write up a report regarding the topic chosen. Results of the survey showed that the independent study project seemed to be novel and challenging to most of the students. Despite the difficulties most of the students had confronted, they were highly appreciative of this "alternative" teaching design. The learning outcomes of this teaching design perceived by the students were not only limited to knowledge development, but also benefited the students' attitudes towards learning and their learning capabilities. The students' appreciation is in accordance with a broad perspective of the aims of higher education: cultivation of students' capabilities and attitudes of learning for life-long learning. Finally, implications to teaching practitioners were provided. Teachers need to seek an optimal point between providing essential support and encouraging independency. Meanwhile, a few students who limited their learning commitment to knowledge accumulation could be skeptical to this independent learning activity. How to convince these students to comprehend the value of the alternative learning task becomes a crucial task for the success of future projects.

Key words：Higher education; Teaching goals; Physics course; Independent study project; Life-long learning